

5. Hyo

Program Name: Hyo.java

Input File: hyo.dat

Hyo is researching Facebook friend recommendations. He wants to see if there is a pattern in the degree of separation between two people and the Facebook friend recommendations. The degree of separation between two people is defined by the number of friendship steps between them. Two people who are friends directly with each other have a separation degree of 1.

For example:

Carla has 3 friends, Jeff, Martin, and Adrian.

Jeff has 1 friend, Carla.

Martin has 2 friends, Carla, and Sam.

Adrian has 1 friend, Carla.

Sam has 1 friend, Martin.

The degree of separation between Carla and Sam is 2, because Carla is a friend of Martin who is a friend of Sam. In this same scenario of friendships, the degree of separation between Jeff and Carla is 1. One degree of separation can be expressed using the phrase, "**is a friend of**", so it can be said that "**Jeff is a friend of Carla**".

Given a scenario of Facebook friendships, and two people within that scenario, determine the degree of separation of the two people, and the friendship steps connecting them.

Input: The first line, N, will be the number of data sets to follow. Each data set will begin with an integer K, denoting the number of people in the friendship scenario. Each scenario will begin with a single name followed by a colon. All names after the colon represent direct friends of that person, separated by single spaces. The final line will have two names that indicate the two people for which their degree of separation and their friendship steps are to be determined.

Output: For each data set, there will be two lines of output. The first line will be the sentence: "**The degree of separation of <person1> and <person2> is <degree of separation>**". " where <person1> and <person2> are the two names listed in the final line of the data set, and <degree of separation> is the number of steps between them in the friendship scenario, as defined above. The second line contains the actual friendship steps, starting with <person1> and ending with <person2>, with the string "**is a friend of**" separating each step. Each sentence is ended with a period.

Sample input:

3	11
3	Arya: Cher Ying
Annie: Bahi	Erik: Qa
Bahi: Carthik Annie	Cher: Arya Bo
Carthik: Bahi	Qi: Shome Thor
Annie Carthik	Ying: Arya Bo
6	Qa: Thor Erik
Salem: Charlie Maona Blaze Cram	Bo: Ying Cher Yoshie
Charlie: Maona Joana Salem	Yoshie: Bo Pradip
Maona: Charlie Salem	Pradip: Yoshie Shome
Blaze: Salem Cram	Shome: Pradip Qi
Cram: Salem Blaze	Thor: Qi Qa
Joana: Charlie	Erik Arya
Salem Maona	

Hyo - Sample output:

The degree of separation between Annie and Carthik is 2.

Annie is a friend of Bahi is a friend of Carthik.

The degree of separation between Salem and Maona is 1.

Salem is a friend of Maona.

The degree of separation between Erik and Arya is 9.

Erik is a friend of Qa is a friend of Thor is a friend of Qi is a friend of
Shome is a friend of Pradip is a friend of Yoshie is a friend of Bo is a
friend of Ying is a friend of Arya.